Effect of putative probiont Enterococcus hirae on the hematological parameters of juvenile African catfish, Clarias gariepinus (Burchell, 1822) during pre- and post-challenge against Aeromonas hydrophila

ABSTRACT

Probiotics have been widely known to have the ability to improve the immune system of livestock and aquatic animal. The present study was carried out to evaluate the effect of dietary supplementation of two probiotic isolates of Enterococcus faecium on hematological parameters of juvenile African catfish, Clarias gariepinus during pre- and post-challenge with aquatic pathogen, Aeromonas hydrophila. The probiotics were previously isolated from vegetable wastes (mung bean sprouts, Vigna radiate and cucumber, Cucumis sativus) which have been fermented for 7 days. The experimental fish (270 tails) with an average weight of 5.13 ± 1.03 g were distributed and divided randomly into i) control (30 tails), fed with commercial diet ii) E1 (30 tails), fed with diets supplemented with 108 CFU/ml of E. faecium isolated from fermented cucumber, iii) E2 (30 tails), fed with 108 CFU/ml of E. faecium isolated from fermented mung bean sprouts. The feeding trial was conducted for 50 days. All experimental groups were then challenged with A. hydrophila (1.5 × 106 CFU/mL) via intraperitoneal injection on day 51. Prior to challenge, blood samples were collected from five fish randomly selected from each group on the day 51 (pre-challenge). After 72 hours of post-challenge, blood samples were again collected from five fish from each groups. The hematological parameters such as total erythrocyte count (RBC), total leucocyte count (WBC), packed cell volume (PCV), hemoglobin (Hb), the derived blood indices of mean corpuscular volume (MCV) and corpuscular hemoglobin concentration (MCHC) were examined. Hematological profiles of pre- and post-challenge infected juvenile catfish were compared with the control groups. The RBC, Hb, WBC, PCV, MCV and MCHC of fish fed with probiotics showed higher significant difference ($P<0.05$) as compared to control groups during pre- and post-challenge of pathogen. The high level of RBC and WBC during pre- and post-challenge showed the capability of the probiotics to improve the immune response of juvenile African catfish and thus increased the fish disease resistance against A. hydrophila infection. The result suggested that E. faecium could be used effectively as a probiotic in aquaculture.

Keyword: Probiotics; Enterococcus hirae; Clarias gariepinus; Aeromonas hydrophila; Hematological parameters